Identification and Assessment of Chemical Safety Vulnerabilities

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Generic Vulnerabilities

1994 DOE Chemical Vulnerability Assessment

- Inadequate Characterization
- Unanalyzed Hazards
- Past chemical Spills
- Lack of Planning
- Improper Storage
- Deteriorated Conditions
- Abandoned and Residual Chemicals
- Inadequate Inventory control

Management Weaknesses

Lack of Commitment to Chemical Safety
Inadequate Management of Aging Facilities
Weaknesses in Facility Transitioning
Inconsistent Budget for Chemical Safety

Chemical Explosion in Tank A109

PRF ROOM 40 *BEFORE* EXPLOSION

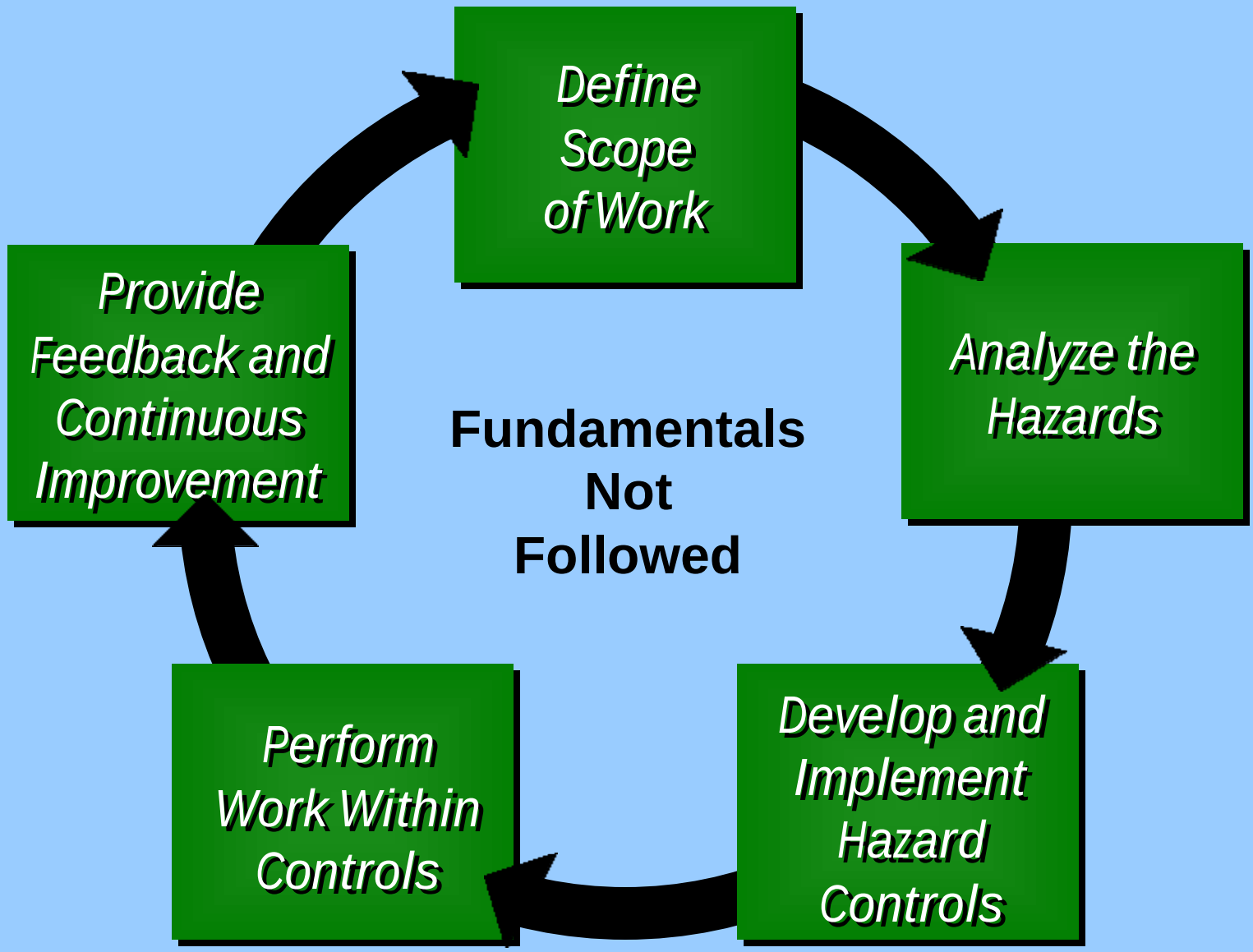
Explosion Impacts

PRF ROOM 40 *AFTER* EXPLOSION

Interior of Tank 241-Z-361

Integrated Safety Management System

Core Functions



1997 Secretarial Directives

Scope

- Use, storage and disposal of chemicals
- Reassessment of known vulnerabilities, and evaluation for new ones on a continuing basis -- emphasis on waste storage tanks
- Technical competence to recognize full range of hazards
- Lessons Learned and Occurrence Reporting programs

Highlights of Actions at Hanford

- Immediate risk reduction through walkdowns and disposal of unneeded chemicals
- Underground inactive tank declared a USQ
- DuPont assistance
- Sitewide chemical management system requirements developed jointly by all prime contractors
- Facility vulnerability assessments completed
- Weaknesses identified in lessons learned programs
- “Picric acid” incident (1/28/98) demonstrated improvements in emergency response and hazard awareness

Challenge at Hanford

- Major issue - sustaining a rigorous, sitewide effort to assess vulnerabilities and complete characterization and corrective actions
  - Size of the problem
  - Technical issues
  - Competing priorities
  - Limited financial resources
- Approach - formal process to ensure that appropriate attention and resources are applied
  - Baseline change request and approval
  - Monthly reporting

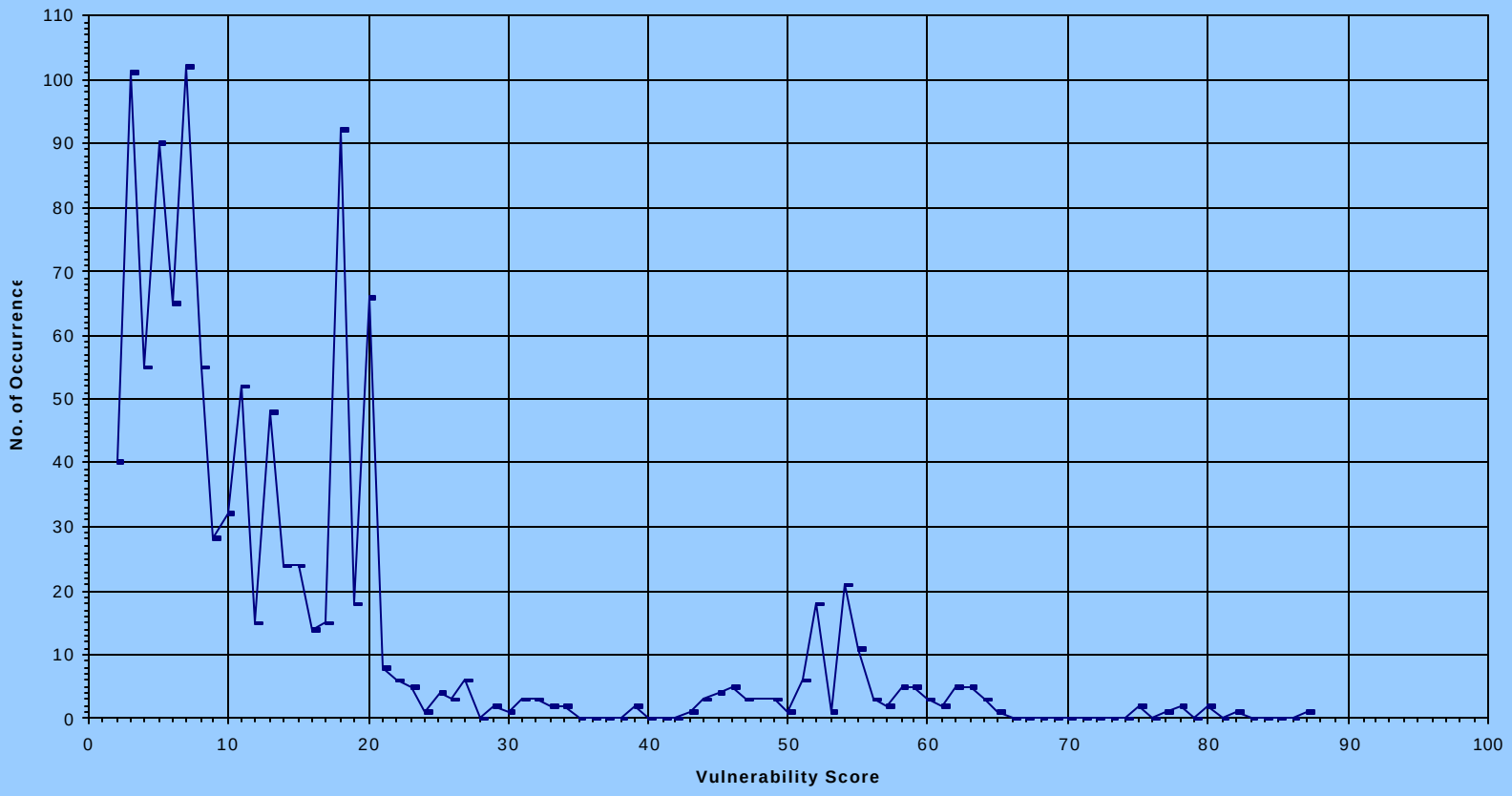
Facility Vulnerability Assessment

- Objectives, Scope, Methodology, Schedule
  - Focus on safety & health risks / corrective actions
  - All PHMC facilities, excluding those explicitly exempted
  - Scope of Vessels/materials/conditions defined
  - Comprehensive baseline on facility & vessel data
- Property & Waste Identification Data System Lists
- QA and documentation requirements
- Project Team and Major Subcontractor POCs
- Independent surveillance/validation

Facility and Vessel Data

- Ownership & identification
- Facility condition & configuration control
- Characteristics/status of vessel and material
- Compatibility between material(s)/vessel
- Type of characterization data
- Need and schedule for further characterization
- Hazard ranking factors - likelihood & severity
- Relative rank and need for additional controls

Score Distribution



Two Groups of Vulnerabilities

Activity-level (score<36):

- **1,157 items (88%) – good knowledge/controls**
- **Actions are part of work planning process**
- **First line supervisor responsible for resolving deficiencies**

- **Facility-level (score ċ 36):**
  - **151 items (12%) – some knowledge/controls**
  - **Actions typically require significant resources due to change in work-scope, priorities, safety basis/controls**
  - **Actions recorded/tracked through Deficiency Tracking System and status reported to senior management**

Status Summary

- Corrective actions managed through ISMS
- Container content data transfer to CMS
- Over 90% of corrective actions completed
- Remaining items being addressed by existing project efforts